

REMARKS

Reconsideration of this application is requested. The indication of allowability of 4, 8, 13 and 14 is appreciated. These dependent claims have been rewritten into independent form to place them in clear condition for allowance.

The rejection of claims 1, 3, 5 and 12 as being obvious over Kaiser (U.S. Patent No. 4,478,615) in view of Smook (Handbook for Pulp and Paper Technologists) is traversed.

The present invention provides anticipatory control of a mixing pump in an approach system of a paper making apparatus or other apparatus that forms a web from pulp. The approach system includes the mixing pump, a gas separation tank and head box feed pump. The approach system delivers a stable pulp flow to the head box of the paper making machine, even when changes occur in the operational mode of the paper making machine.

Regulating the pulp flow to the head box is difficult because a consequence of intentionally changing the pulp pressure at the head box can be that the surface level of the gas separation tank changes, which in turn results in a subsequent change in the pulp pressure at the head box. As described in the specification, prior regulation systems (e.g., control systems that control the surface level of the gas separation tank) often caused undesired oscillations in head box pressure as they reacted (after the fact) to changes in head box pressure and surface levels of the gas separation tank. The present invention relates to regulating the feed of pulp to a paper making machine to compensate

for anticipated variations that will influence the pulp stream, such as changes in the head box operating condition.

The prior art (Kaiser, Smook or Clark) do not teach anticipatory control by an approach system to achieve stable pulp flow through an approach system to a paper making machine. Kaiser, Smook and Clark do not disclose a regulation system which changes head box pressure, or that changes the output of both the mixing pump and the head box feed pump simultaneously. Further, Kaiser, Smook and Clark also do not teach surface level regulation of the gas separation tank that is controlled to compensate for changes in the operation of the paper making apparatus.

Independent method claim 1 defines a method for controlling an approach system that has several steps that are not disclosed or suggested by the applied prior art including (without limitation): a **regulation system** "which essentially simultaneously checks a need for changing an operational mode of the mixing pump, initiates a change of the operational mode of the mixing pump according to said need, and both guides and regulates a head box feed pump."

The claimed "regulation system" responds to a "need" for an operational change of the mixing pump by "simultaneously" changing the operation of the mixing pump and the head box feed pump. The mixing pump (112 in the present application) governs the feed of water and pulp flowing into the gas separation tank (116). The head box feed pump (118) governs the pulp flow to the head box (122). Because it simultaneously controls the mixing pump and the head box pump, the regulation system (150) provides better

control of the pulp feed to the head box and (for example) provides a stable pulp flow to the head box that does not unnecessarily oscillate due to operational changes in the head box.

Kaiser (at col. 2, lns. 56-65; col. 5, lns. 20-75) teaches maintaining a constant surface level in a gas separation tank. It teaches away from controlling both a mixing pump (4 in Kaiser) and a head box pump (12) to regulate the pressure to the head box. The difficulties with controlling an approach system by maintaining a constant level in the gas separation tank are documented in this application and include causing oscillations in the pulp flow to the head box. Because it teaches away from the claimed regulation system, Kaiser cannot be properly applied to support the pending obviousness rejection. *In re Geisler*, 43 U.S.P.Q. 2d 1362 (Fed. Cir. 1997)(“a prima facie case of obviousness can be rebutted if the applicant (1) . . . or (2) can show “that the art in any material respect taught away” from the claimed invention.”).

Smook (Section 16.2) describes an approach system having a "fan pump which serves to mix the stock with the white water and deliver the blend to the head box." The statement in Smook that "[b]oth flow rate and pressure must be stable, without pulsations or surges, . . ." is not a disclosure of a control system or a teaching that a control system should simultaneously control a mixing pump and an head box pump in response to a "need" for an operational change in the mixing pump.

The Action states without support that it "would have been obvious . . . to simultaneously control the output of a mixing pump and head box pump responsive to

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changes on the paper machine in order to uniformly deliver stock to the head box and obtain a sheet with desirable properties." The applied prior art does not teach this feature. This statement is in the Action is contradicted by Kaiser that teaches controlling an approach system by holding steady the level in the gas separation tank. The claimed regulation method cannot be said to have been obvious when the prior art teaches away from the claimed method and there is no suggestion in the prior art to actually use the claimed method.

With respect to the dependent claims, the obviousness rejection should be withdrawn for additional following reasons that the prior art does not teach:

- simultaneously changing the operating points of the mixing and head box pumps, as recited in claim 3.
- initiating a control function due to a change in the head box feed pump operating point, as recited in claim 5.
- responding to a fast change in the head box pressure by simultaneously changing the capacities of both the head box feed pump and mixing pump.

The rejection of claims 2, 6, 7 and 9 through 11 as being obvious over Kaiser in view of Smook and further in view of Clark (U.S. Patent No. 2,717,536) is traversed for the reasons stated above in connection with independent claim 1 and also because Clark (col. 6, lns. 55-60) teaches maintaining a constant level in the storage tank. Clark (as does Kaiser) teaches away from a regulation system that responds to a need for a change

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in the mixing pump by simultaneously controlling the mixing pump and head box feed pump. Further, Clark does not suggest:

- controlling the pressure at the head box in addition to controlling the surface of the gas separation tank, as is recited in claims 2 and 6.
- maintaining constant the head box pressure, while also monitoring the surface level in the gas separation tank, as called for in claim 9.
- Controlling the pumps to intentionally change the surface level in the gas separation tank, as called for in claims 10 and 11.

All claims are in good condition for allowance. If any small matter remains outstanding, the Examiner is requested to telephone the undersigned. Prompt reconsideration and allowance of this application is requested.

Respectfully submitted,

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